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RECORD OF ORAL HEARING
UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte PETER-PIKE J. SLOAN *et al.*

Appeal 2010-001038
Application 10/692,361
Technology Center 2600

Oral Hearing Held: Wednesday, January 12, 2011

Before MAHSHID D. SAADAT, MARC S. HOFF, and CARLA M. KRIVAK, Administrative Patent Judges

ON BEHALF OF THE APPELLANT:

ROBERT SCOTTI, ESQ. (Via Telephone)
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1 *The above entitled matter came on for oral telephonic hearing*
2 *on Wednesday, January 12, 2011, commencing at 1:05 p.m., at the U.S.*
3 *Patent and Trademark Office, 600 Dulany Street, Alexandria, Virginia,*
4 *before Jan Jablonsky, Notary Public.*

5
6 JUDGE SAADAT: Could you spell your name for the Reporter
7 of the hearing?

8 MR. SCOTTI: Yes. Robert, R-o-b-e-r-t. Scotti, S-c-o-t-t-i.

9 JUDGE SAADAT: Thank you. We have the record before us.
10 You can start. As you know, you have 20 minutes.

11 MR. SCOTTI: Okay. Thank you. Good morning.

12 I am not the person who drafted the application and all the
13 documents before the panel. Stephen Wight is no longer with the firm. I am
14 stepping in. I apologize if I don't have the background that he may have. I
15 did review all the documents, and I did talk to Steve Wight about the case.

16 The genesis of how the case came about is that the Applicant.
17 Sloan, came up with a technique that was applied for in a previous patent
18 application that is called "Graphics Image Rendering with Radiance
19 Transfer," and that is in Publication No. U.S. 2003, 0179197. That is the
20 primary reference used.

21 Mr. Sloan's manager came to him and basically said this is a
22 great technique and valuable to our company, but it doesn't work on a
23 graphics processing unit. Please convert this so it works on a graphics
24 processing unit.

25 I really hope when the Board looks at everything, they just take
26 that into consideration because that is how the application came about, and
27 just taking this previous application and converting it to a graphics
28 processing unit is not that easy.

29 JUDGE KRIVAK: Can you go back a minute? There is a
30 Sloan reference, not the Sloan – "The Pre-Computed Radiance Transfer for
31 Real Time Rendering in Dynamic Low Frequency Lighting Environments."
32 That is what the Examiner was relying on.

1 The rejection that we have on record is based on Sloan article
2 titled "Pre-computed Radiance Transfer for Real Time Rendering in
3 Dynamic Low Frequency Lighting Environments," in view of Burke.

4 MR. SCOTTI: My apologies. That does apparently disclose
5 the same thing. My apologies. I misquoted that.

6 I think the point is the same in any event. He came up with this
7 previous technique and he had to convert it to a GPU. That previous
8 technique is described in the application that was filed here, and that
9 previous technique had to do with -- I think it is best shown in Figure 1 of
10 the application that was filed, in that there is a point, a single point, they
11 calculate the radiance transfer coefficients by iterating over all the
12 directions.

13 What the inventor had to do to modify this for a graphics
14 processing unit was to figure out a way to make it so that it operates on an
15 array of points, because apparently graphics processing units are much more
16 efficient if you're operating on an array of points.

17 He had to change the technique from what is shown in Figure 1
18 to do something different. I think some of the claim language that should be
19 highlighted is in Claim 1, close to the end of the claim, there's a paragraph
20 that starts "Accumulating the radiance transfer contributions," it's about
21 seven lines up from the bottom of Claim 1, "Accumulating the radiance
22 transfer contributions for a set of sampled points," so it's operating on
23 multiple points, for a current direction, and accumulating that with
24 previously iterated directions.

25 I think that paragraph and the next paragraph is something that
26 the Examiner was not able to find in any of the references of record. Also,
27 producing a radiance transfer value for each of the sampled points from the
28 accumulated radiance transfer contributions for the iterated directions.

29 A lot of the language that is in this claim will be in the Sloan
30 paper that you referred to, but the bottom line is from the inventor's point of
31 view, whatever is in that paper did not help him. He had to adapt that paper

1 to a graphics processing unit, and that was research and design that he had to
2 do to come up with the method that we are trying to patent here today.

3 It is not a trivial change. It is something that required a lot of
4 work. We believe it merits a patent.

5 The Examiner's references, of course, he is going to find a lot of
6 the words that are similar in that paper, but the bottom line is that it wasn't
7 just a simple reordering of the specs that were done. There was more
8 involved.

9 Some of the references that the Examiner cites, and I think
10 some of the arguments that came down, were there was a reordering of the
11 loops, and that was to take advantage of the graphics processing unit so that
12 it operated on sets of points.

13 I think what the Examiner was feeling -- I don't know if the
14 Examiner is there today -- I think the Examiner was like what he did was
15 switch two loops. I think that is an over simplistic view of what the inventor
16 had to do. It wasn't that simple as just switching two loops.

17 I think Steve Wight who wrote the appeal brief pointed that out,
18 that if you just swapped the loops, it doesn't actually work, there is more to it
19 than that.

20 If you look at those paragraphs I cited in the claim, and I
21 believe the claim is very particular and very narrow, that those words -- the
22 operation on a set of points over iterated directions and accumulating that
23 with previously iterated directions, I was not able to find that in any
24 reference of record.

25 The references that the Examiner cites just say there are various
26 strategies for nesting loops. Yes. That's true. If I was programming, I could
27 do wild moves and I can do four loops, and there is a lot of different ways to
28 do loops, but that didn't help Mr. Sloan when his manager came to him and
29 said make this work on a graphics processing unit.

30 Everybody knows you can do loops different ways. That
31 doesn't solve the problem. I don't see anything in Burke or the previous
32 Sloan or Purcell that shows how to do that.

1 JUDGE SAADAT: Are you suggesting that it wouldn't have
2 been obvious to reverse the loops?

3 MR. SCOTTI: That's what I'm suggesting.

4 JUDGE SAADAT: The rejection is based on obviousness even
5 though the reference doesn't teach it, would one of ordinary skill in the art
6 have found it obvious to reverse the loops.

7 MR. SCOTTI: That's right. That's what it really comes down
8 to. That is the only thing that from this hearing when we walk away that I
9 hope the Board looks at it and says if I had this paper and my manager came
10 to me and said make this work on a graphics processing unit, is it obvious to
11 reorder the loops, and more than reorder the loops. There is more to that as
12 pointed out in the appeal brief. There are other things that go into it. It's not
13 just swapping two loops.

14 It turns out in an over simplistic view of things, yes, you do
15 have to reorder the loops so you iterate over a set of points rather than a
16 single point. I'm suggesting that is in no way obvious to do that.

17 JUDGE SAADAT: Can you tell us what specifically would not
18 work in reference Sloan if the loops were reversed?

19 MR. SCOTT: Yes. I think in the appeal brief that Steve Wight
20 created on page 11, he basically swaps the two loops, just changing the
21 direction for the points. I think if you look at that, it is different than in the
22 application, the result is different than the application.

23 I'm just going to pull up the application here. The application
24 in Figure 4 specifically shows what the actual algorithm looked like. If you
25 look at page 11 of the appeal brief, and say if the Examiner is correct, and
26 we just swapped the loops, the bottom of page 11 shows what the loop will
27 look like, but Figure 4 of the application shows what the actual loop is, and
28 you can see it's different.

29 In particular, there is the S-PAS equals projected PD statement,
30 the ZD statement, and those statements are different.

31 There are different things just looking at the code. It comes out
32 different. The other thing that comes out different is if you think about it, if

1 you look at Figure 1 of the present application, what the prior algorithm is
2 trying to do is take one point and iterate over a bunch of directions, whereas
3 the new application is operating on a set of points, and then it not only takes
4 the currently iterated directions, but it accumulates with other previously
5 iterated directions.

6 That's the claim language I was talking about seven lines up
7 from the bottom, that it's doing more than just swapping the loops.

8 To answer your question, I tried to take a two prong approach.
9 Number one, if you just look at the code, it looks different, and then I tried
10 to explain what is actually happening, that it is different as well.

11 Does that make sense?

12 JUDGE SAADAT: It does.

13 MR. SCOTTI: I know this is very highly technical, this stuff.
14 Overall, I think the claim is very specifically tailored and very narrow.

15 JUDGE SAADAT: We understand that is your argument, you
16 want to emphasize the difference between the two loops or switching them.

17 MR. SCOTTI: Correct. The inventor was not able to just swap
18 two loops. It was not that easy. It's the notion of operating on sets of points
19 over an iterated direction, whereas the previous application had the work
20 operate on a single point and iterate over multiple directions. This is
21 working on multiple points at the same time, which is more efficient for a
22 graphics processing unit that is used to working on ray data.

23 In addition to that, accumulating with other directions in order
24 to determine these coefficients that need to be determined.

25 JUDGE KRIVAK: The Examiner made some allegations with
26 respect to the textures, saying that Burke clearly teaches the texture
27 mapping, then the object position textures. How does that differ from your
28 application?

29 MR. SCOTTI: The claim does focus on a texture based
30 operation. To be honest, I looked at Burke. I wasn't able to see that it
31 was -- from the Examiner's response, I think he was talking about paragraphs

1 35 and 36. I didn't see anything in there that was talking about the same
2 thing that the application claims seem to be talking about.

3 I was kind of confused with what the Examiner was referring
4 to.

5 JUDGE KRIVAK: 35 does say that for each sampled point, it
6 receives data representing the position of the point, the color of the point,
7 including vertex color, matt, textures, et cetera. I think that's what he was
8 relying on.

9 MR. SCOTTI: Right, but again there, you're taking one point,
10 whereas the claim language is talking about operating on sets of points, and
11 Figure 1 of the application, which is talking about what was done before was
12 also operating on a single point, and that was really the problem. That's why
13 it doesn't work on a graphics processing unit, because you need to operate on
14 sets of points.

15 I really can't answer your question about the specific texture
16 stuff, because the texture language is the same, you're saying, I guess. Even
17 if you look at that language they are referring to there, and you look at all the
18 texture based language in the claim, there is a point in the claim above all the
19 texture based language, so Claim 1, for example, nine lines down starts
20 "Iteratively, for each set of directions," you do these operations.

21 I don't see that happening in here. In the paragraph you're
22 talking about, it does say the word "texture," but for each direction, it doesn't
23 seem like it's doing the texture based operation, and then throughout this
24 claim, it talks about when it's doing the texture based operation, it's talking
25 about for a set of points. It's not one point, which is what paragraph 35 talks
26 about, but it's operating on sets of points, which I think is one of the
27 important aspects of the application, that it is using sets of points and
28 iterating over directions for that.

29 Again, it also accumulates that with previously iterated
30 directions, which is nine lines up from the bottom of Claim 1.

31 Where in paragraph 35 is it talking about accumulated with
32 previous directions? Maybe it mentions a direction for a point, but that

1 seems to bring us back to Figure 1 of the application, which is showing what
2 the prior art did in the first place.

3 I just don't see anything in this reference that has that specific
4 concept in it and the specific claim language.

5 Does that make sense?

6 JUDGE SAADAT: We understand your position. Mr. Scotti,
7 do you have any other point you want to make?

8 MR. SCOTTI: Only that the specific claim language that I
9 mentioned where it's accumulating over a sampled point, that same language
10 is in each of the independent claims near the bottom of the claims. The
11 claims are all consistent in that regard. All the claims talk about
12 accumulating over a set of sampled points, not just one point, for multiple
13 iterated directions.

14 The arguments that I stated today in regard to Claim 1 seem to
15 apply equally to all the independent claims.

16 JUDGE SAADAT: Do you have any more questions?

17 JUDGE KRIVAK: I do have a basic question for you. What is
18 the difference -- Burke states the present invention re-samples the data in
19 each group as a vector value field in a parametric U and V grid space, and
20 then it goes on to say this space is not the same as a texture UV space.

21 Could you just explain that difference to me?

22 MR. SCOTTI: Can you point out where you are talking about?

23 JUDGE KRIVAK: It is paragraph nine of Burke. You cited
24 that or Mr. Wight did on page 18 of your brief. Are there different spaces
25 that you can map to? Maybe not "map."

26 MR. SCOTTI: It's in paragraph nine, you said?

27 JUDGE KRIVAK: Yes, paragraph nine, and on page 18 of
28 your brief. I guess what's the difference between "grid space" and "texture
29 UV space," just for my edification.

30 MR. SCOTTI: I can't say I even know. Again, this stuff is so
31 technical that it's difficult to map these references together. I do know the
32 point was that this reference does not iterate over points, so to calculate

1 radiance transfer contributions over all the points for a particular direction
2 and then adding that to previous directions.

3 You seemed to focus more on the texture based operation, and
4 I'm not sure what the difference is there. I apologize for that.

5 JUDGE SAADAT: Any more questions?

6 JUDGE KRIVAK: Let me just take a look.

7 JUDGE SAADAT: There may be more questions for you.

8 MR. SCOTTI: Okay. I'm sorry we don't have the inventor on
9 so he could answer these more difficult questions.

10 (Pause.)

11 JUDGE KRIVAK: Okay. I think I'm good. I don't have any
12 other questions.

13 JUDGE SAADAT: There are no more questions on this side.
14 Do you have anything else to add?

15 MR. SCOTTI: No, I think that's it from our side.

16 JUDGE SAADAT: All right.

17 (Whereupon, at 1:27 p.m., the proceedings were concluded.)

18 * * * * *